Health and safety at work

Institute of Geophysics

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Part 1: Safety in the institute
- Insurance coverage
- Way-to-work accidents
- Accident risks/transport advices
- Workstation
- Fire safety/first aid
- Assembly place
- Conduct in case of fire
- First aid in case of accidents

Part 2: Safety in the lab
- Laboratory rules of conduct
- Electrical accidents/electric safety
- Work with acids
- Danger signs
The University, as an employer, is legally obliged to carry out an annual safety training for employees and students.

The Fund for accidents at work (Unfallkasse UK Nord) is responsible for the accident insurance for students and public employees in Hamburg and Schleswig-Holstein.

Exception: civil servants are insured through their employer.
On the way to the University and on short work trips accident risks must be avoided.

Possible accident risks are:
- Time pressure
- Inattention
- Lack of safety on used means of transport
- Slip and stumbling hazards due to inappropriate footwear
Recognize hazards and avoid accidents

Possible accident risks are:

**Blocked emergency exits**

**Slippery floors**

**Tripping hazards, for example with cables on the floor**

**Objects/Furniture with sharp angles**
When you transport heavy equipments

Use an appropriate trolley

Lift the equipment with the adequate support

Remove the cables before the transportation

Follow the safety instructions and warning signs on the equipment
The orientation of the workstation should meet the ergonomics recommendations:

Sit dynamics

>>> Change position, move yourself, stand up and so on

Distance from the monitor

>>> same as to the keyboard (depending on the monitor 50-80 cm)

Correct position of the keyboard

>>> 10-15 cm from the desk edge

Letters on the screen

>>> big enough: at 50 cm distance 3 mm

Lighting

>>> put the monitor in the right corner towards the window, avoid reflections
Put the chair in a way that thigh and lower leg form a 90° (or greater), with your feet completely flat on the floor.

Upper- and forearm should also form a 90° angle, when your forearm rests on a line with the keyboard.

If this is not possible, use a footrest or adjust the height of the desk, if you have a height-adjustable table.
If you have vision problems you should get a vision test

If you have damaged hardware (unusual noises, flickering/unsharp images), inform the technical assistance team immediately.
Symbols overview

- Fire alarm (manual)
- Fire extinguisher
- Escape route
- Assembly point
Conduct in case of fire (see also firefighting guidelines)

- Keep calm! Sudden and unconsidered action will cause panic!
- Call the fire brigade. **Emergency call fire brigade** ☎️ 0-112
- If you hear the fire ⬇️ ⬅️ ⬅️ ⬅️

- Rescuing lives is more important than fire fighting

- In case of emergency:
  - Inform others in your proximity, take helpless people with you
  - Ensure your own self-protection
  - Follow the instructions of the evacuation officers
  - Follow the evacuation route
  - Use the staircase. **Do not take the lift!**
  - Go to the assembly place. Check for everyone
Conduct in case of fire: the use of fire extinguishers

Try to extinguish the fire! Use fire extinguishers, close doors and windows

For a prompt reaction, you should know where the fire extinguishers are in the building!

Fire extinguishers are in the corridors, in the lift hall next to the fire brigade lift and in the following rooms of the institute: 1319, 1329, 1333, 1335, 1433

Fire extinguishers
### Conduct in case of fire: attempt to extinguish the fire

<table>
<thead>
<tr>
<th>ZH 1/112</th>
<th>CORRECT</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face the fire in wind direction</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>Face the fire from the origin</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>Extinguish drop and flow fires from top to bottom</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>Clear wall fires from the bottom to the top</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>Use enough extinguishers simultaneously, not one after the other</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>Beware of reignition</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
<tr>
<td>After using the extinguisher, do not return it to the holder. Refill it!</td>
<td>![Correct Image]</td>
<td>![False Image]</td>
</tr>
</tbody>
</table>

- **Try to extinguish the fire only if it’s not dangerous!**
- **Aim the extinguisher nozzle at the base of the fire.**
- **After a successful extinguishing a fire:**

  *Keep on observing the sources of the fire!*

*Keep fire barriers, windows and doors closed.*
In case of fire, the main hazard is fire smoke, which can be poisonous, corrosive or suffocating.

For this reason, when you leave the dangerous area, you must close the doors (but do not lock them), in order to prevent the spreading of the smoke.
• Leave the smokey areas crawling or bowed down, because the air on the floor is mainly smokeless.
• In case of smokey staircases and corridors, go to the secondary escape stairways.

• If this is not possible, stay in a safe place, for example on an escape balcony. From there, make sure you are visible, draw the attention of the fire brigade to yourself.
Old and new safety symbols: currently both valid

Safety signs

Important information

Old and new safety symbols: currently both valid

Firefighting

Important information

Please note the revised fire safety signs which will be successively introduced

2014 Safety in the institute
First-aid kit

Automated external defibrillator (AED)

Eye wash station (Lab)

Emergency shower (Lab)
Every accident must be documented in the first-aid book.

The first-aid book is in the first-aid box.

First aid boxes are in the following rooms: 1324, 1427
First-aid in case of accidents

First responders must be sure that, in helping injured people, they are not endangering themselves.

In each first-aid box there’s a first-aid book, where each light injury has to be documented, for example cuts.

In case of accidents, inform a first-responder immediately, and if necessary call, the Emergency number 0-112.
First responders in the geophysics

Joachim Bülow   R. 1441/-42   Tel. 5058
Paola Dal Corso R. 1405      Tel. 2973
Dr. Ekkehard Teßmer R. 1436   Tel. 5050
Benedikt Weiß   R. 1337      Tel. 6369
Dr. Klemen Zaksek R. 1411     Tel. 4921
When working in a lab, a second person must always be present.

Untrained personnel can remain in the lab only under professional supervision.

Work carefully. Protect yourself and others.
Basic rules for lab safety: eating, smoking, use of telephone

Eating, drinking, smoking and mobile phones, as well as keeping food in the lab, is strictly prohibited

Smoking is not allowed in the whole Geomatikum.
Danger symbols according to GHS (Globally Harmonised System)

- **Exploding bomb:** Explosive

- **Flame:** flammable, Extremely flammable, ...

- **Environment:** Environmentally dangerous

- **Gas cylinder:** Pressurized gases

- **Flame over circle:** Oxidizing substances

- **Corrosive:** Skin corrosive, Risk of damage to the eyes
Basic rules for lab safety: symbols

Danger symbols according to GHS (Globally Harmonised System)

Irritant:
• Harmful to health (acute toxicity cat. 4)
• Anesthetic
• Skin-irritating
• Irritation to respiratory system
• …

Health Hazard:
• Harmful to health (target organ toxicity cat. 3)
• CMR-substance cat. 1
• May cause damage to organs
• Allergenic if inhaled
• Aspiration lethal
• …

Skull and cross bones:
• Harmful to health (target organ toxicity cat. 1)
• Toxic
• Poisonous
• …

Symbol combination as indication of combination of different hazards
New labels: labelling elements

- Pictogram
- Quantity, when the substance is made available to the general public
- Name, address, telephone number of the supplier
- Name and product identification

Signal word

Hazard statements: number according to CLP-V
Precautionary statements, maximum 6
Basic rules for lab safety: order and training

Keep the laboratory workplaces clean. EVERYONE is responsible for order and cleanliness

!!! This also applies to the kitchens!!!!

The use of equipment shall only be permitted according to the before mentioned instructions
Basic rules for lab safety: Safety regulations

The safety code should be observed

appropriate protection equipment has to be installed and used:
lab coat, long pants, close-toed and non-slip footgear
protective eyewear with side protectors
Chemical and heat resistant safety gloves
no jewelry
if necessary wear a hairnet

The personal protective equipment is available and must be used.
Only use as much of hazardous substances as needed in the laboratory.

Safety sheets must be available and accessible.
Report any accident, near accident, and damages immediately.

In case of fire, leave the laboratory immediately. If possible, shut down equipment, disconnect them to the main supply (emergency stop)
Test-tube experiments can be dangerous

Properties of the substances must be known.
• Work with chemical substances only in the fume hood

• Before working with the fume hood, check all functions and clean it

• Always keep the front sash closed

• Raise the front sash only as far as necessary
• In case of accident, consult a first responder immediately
• **First responders must take care of their self-protection**
• Avoid direct contact with acids
• Acid contaminated clothing should be removed immediately
• If there's a large amount of acid on your body use the safety shower immediately
• If you get acid in your eyes, immediately use the eye wash station and rinse vigorously (pay attention to correct procedure).
Safety symbols in the laboratory

Emergency shower

Eye wash station
Electrical safety (applied everywhere)

- No operation of open electrical equipment is permitted

- Familiarize yourself with the location of the emergency stop switch.
Electrical safety (applied everywhere)

- In the electronics lab, electronic instruments must remain with the appropriate safety devices.

- The use of the laboratory (and also of the storerooms and warehouses) is permitted only after reading and signing the safety instructions.
• Work only with intact devices; inform immediately about defective devices.

• Defective 230 V-devices must be disconnected from the mains.

• 230 V devices are only to be opened by qualified electricians.
Accidents with electricity (applied everywhere)

Cut power by switching off, removing the plug.

Remove the fuse. If this is not possible immediately, victims should be isolated from the objects and the mains supply.
Keep calm!

Emergency number 0-112!

Provide first-aid.

- Check breathing

- Breathing in unconsciousness – keep the person in the recovery position and keep on checking breathing

- If breathing stops, perform rescue breathing and cardiopulmonary resuscitation (CPR). If necessary use the defibrillator (AED)
Auswirkung von Licht auf das Auge

Augenhintergrund nach Lasereinstrahlung
Auswirkung von Licht auf das Auge

**Ultravioletttes Licht:**
Linsen- und Hornhauttrübung (Schneebblindheit)

![Ultraviolet light diagram](image)

**Sichtbares und infrarotes Licht:**
Zerstörung der Netzhaut

![Visible and infrared light diagram](image)

Gefahr ab 1 µW
Gefahr ab 1 mW
Laser: safety instructions and protective measures

Argon

Dioden

Nd:YAG

2014 Lab safety
Security officers:
Dr. Ekkehard Teßmer R. 1436 Tel. 5050
Joachim Bülow R. 1441/-42 Tel. 5058

First-aid responders:
Joachim Bülow R. 1441/-42 Tel. 5058
Paola Dal Corso R. 1405 Tel. 2973
Dr. Ekkehard Teßmer R. 1436 Tel. 5050
Benedikt Weiß R. 1337 Tel. 6369
Dr. Klemen Zaksek R. 1411 Tel. 4921

Evacuation helpers
Dr. Ekkehard Teßmer R. 1436 Tel. 5050
Dr. Ali Dehghani R. 1303 Tel. 2978
Thank you for your attention